

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A flat-type display comprising;
a first panel and a second panel which are bonded to each other in their circumferential portions and having a space between the first panel and the second panel, the space being in a vacuum state, in which
a spacer is disposed between a first panel effective field and a second panel effective field that work as a display portion;
wherein the spacer is fixed to the first panel effective field and/or the second panel effective field with a first low-melting-point metal material layer,
wherein a first top surface of the spacer is electrically connected to the first panel through a first electrically conductive material layer and a the first low-melting-point metal material layer, the first electrically conductive material layer being between the first top surface of the spacer and the first low-melting-point metal material layer,
wherein a second another top surface of the spacer is electrically connected to an second electrically conductive layer formed on the second panel through a second low-melting-point metal material layer and a second electrically conductive material layer, the second electrically conductive material layer being between the other top second surface of the spacer and the second low-melting-point metal material layer,
wherein the melting point of the low-melting-point metal material constituting the first low-melting-point metal material layer is 120° C to 400° C.
2. (Original) The flat-type display according to claim 1, in which the spacer is formed of ceramics or glass.
3. (Original) The flat-type display according to claim 1, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass.
4. (Original) The flat-type display according to claim 1, in which the first panel and the

second panel are bonded to each other in their circumferential portions through a bonding layer made of a low-melting-point metal material.

5. (Original) The flat-type display according to claim 1, in which the flat-type display is a cold cathode field emission display, the first panel is an anode panel in which an anode electrode and a phosphor layer are formed, and, the second panel is a cathode panel in which a plurality of cold cathode field emission devices are formed.
6. (Original) The flat-type display according to claim 1, in which a plurality of spacer holders for temporarily holding the spacer are formed in the first panel effective field and/or the second panel effective field.
7. (Original) The flat-type display according to claim 6, in which the spacer is formed of ceramics or glass.
8. (Original) The flat-type display according to claim 6, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass.
9. (Original) The flat-type display according to claim 6, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of a low-melting-point metal material.
10. (Original) The flat-type display according to claim 6, in which the flat-type display is a cold cathode field emission display, the first panel is an anode panel in which an anode electrode and a phosphor layer are formed, and,

the second panel is a cathode panel in which a plurality of cold cathode field emission devices are formed.

11. (Currently Amended) A method for manufacturing a flat-type display, said flat-type display comprising a first panel and a second panel which are bonded to each other in their circumferential portions and having a space between the first panel and the second panel, the space being in a vacuum state, a spacer being disposed between a first panel effective field and a second panel effective field that work as a display portion,

said method comprising;

(A) arranging a spacer on the first panel effective field, said spacer with having a first electrically conductive material layer formed on a first one top surface thereof and a first low-melting-point metal material layer formed on a the top surface of the first electrically conductive material layer, the first electrically conductive material layer being between the first surface of the spacer and the first low-melting-point metal material layer, on the first panel effective field, the melting point of the first low-melting-point metal material constituting the low-melting-point metal material layer being 120° C to 400° C, then,

(B) heating the first low-melting-point metal material layer to melt the same and thereby fixing said spacer to the first panel effective field, the first top-surface of the spacer being electrically connected to the first panel through the first electrically conductive material layer and the first low-melting-point metal material layer, and then,

(C) placing the second panel on a second the other top surface of the spacer, the second other top-surface of the spacer being electrically connected to an electrically a second conductive layer formed on a top-surface of the second panel through a second low-melting-point metal material layer and a the second electrically conductive material layer, the second electrically conductive material layer being between the second other top-surface of the spacer and the second low-melting-point metal material layer, bonding the first panel and the second panel to each other in their circumferential portions, and vacuuming the space sandwiched between the first panel and the second panel.

12. (Original) The method for manufacturing a flat-type display according to claim 11, in which the spacer is formed of ceramics or glass.

13. (Original) The method for manufacturing a flat-type display according to claim 11, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass.

14. (Original) The method for manufacturing a flat-type display according to claim 11, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of a low-melting-point metal material.

15. (Original) The method for manufacturing a flat-type display according to claim 11, in which

the flat-type display is a cold cathode field emission display,

the first panel is an anode panel in which an anode electrode and a phosphor layer are formed, and,

the second panel is a cathode panel in which a plurality of cold cathode field emission devices are formed.

16. (Original) The method for manufacturing a flat-type display according to claim 11, in which

the flat-type display is a cold cathode field emission display,

the first panel is a cathode panel in which a plurality of cold cathode field emission devices are formed, and,

the second panel is an anode panel in which an anode electrode and a phosphor layer are formed.

17. (Original) The method for manufacturing a flat-type display according to claim 11, in which

a second low-melting-point metal material layer is formed on the other top surface of said spacer, and,

the second low-melting-point metal material layer is melted together when the first panel and the second panel are bonded to each other in their circumferential portions in said step (C), and said spacer is thereby fixed to the second panel effective field.

18. (Original) The method for manufacturing a flat-type display according to claim 17, in which the spacer is formed of ceramics or glass.

19. (Original) The method for manufacturing a flat-type display according to claim 17, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass.

20. (Original) The method for manufacturing a flat-type display according to claim 17, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of a low-melting-point metal material.

21. (Original) The method for manufacturing a flat-type display according to claim 17, in which

the flat-type display is a cold cathode field emission display,

the first panel is an anode panel in which an anode electrode and a phosphor layer are formed, and,

the second panel is a cathode panel in which a plurality of cold cathode field emission devices are formed.

22. (Original) The method for manufacturing a flat-type display according to claim 17, in which

the flat-type display is a cold cathode field emission display,

the first panel is a cathode panel in which a plurality of cold cathode field emission devices

are formed, and,

the second panel is an anode panel in which an anode electrode and a phosphor layer are formed.

23. (Original) The method for manufacturing a flat-type display according to claim 11, in which a plurality of spacer holders for temporarily holding the spacer are formed in the first panel effective field and/or the second panel effective field.

24. (Original) The method for manufacturing a flat-type display according to claim 23, in which the spacer is formed of ceramics or glass.

25. (Original) The method for manufacturing a flat-type display according to claim 23, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass.

26. (Original) The method for manufacturing a flat-type display according to claim 23, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of a low-melting-point metal material.

27. (Original) The method for manufacturing a flat-type display according to claim 23, in which

the flat-type display is a cold cathode field emission display,

the first panel is an anode panel in which an anode electrode and a phosphor layer are formed, and,

the second panel is a cathode panel in which a plurality of cold cathode field emission devices are formed.

28. (Original) The method for manufacturing a flat-type display according to claim 23, in which

the flat-type display is a cold cathode field emission display,

the first panel is a cathode panel in which a plurality of cold cathode field emission devices are formed, and,

the second panel is an anode panel in which an anode electrode and a phosphor layer are formed.

29. (Currently Amended) A method for manufacturing a flat-type display, said flat-type display comprising a first panel and a second panel which are bonded to each other in their circumferential portions and having a space between the first panel and the second panel, the space being in a vacuum state, a spacer being disposed between a first panel effective field and a second panel effective field that work as a display portion,

said method comprising;

(A) providing the first panel in which a first low-melting-point metal material layer is formed in a portion where the spacer is to be fixed in the first panel effective field, the melting point of the low-melting-point metal material constituting the first low-melting-point metal material layer being 120° C to 400° C.

(B) forming a first electrically conductive material layer on a first the top surface of the spacer that is to be fixed to the first low-melting-point metal material layer formed in a portion where the spacer is to be fixed in the first panel effective field,

(C) arranging the spacer on said first low-melting-point metal material layer with the first electrically conductive material layer between the spacer and the first low-melting-point metal material layer, and heating the first low-melting-point metal material layer to melt the same, thereby fixing said spacer to the first panel effective field, the top surface of the spacer being electrically connected to the first panel through the first electrically conductive material layer and the low-melting-point metal material, and then,

(D) placing the second panel on a second the other top surface of the spacer, the second other top surface of the spacer being electrically connected to an electrically conductive layer formed on a top surface of the second panel through a low-melting-point metal material layer and the second a electrically conductive material layer, the second

electrically conductive material layer being between the second ~~other~~ top surface of the spacer and the second low-melting-point metal material layer, bonding the first panel and the second panel in their circumferential portions and vacuuming the space sandwiched between the first panel and the second panel.

30. (Original) The method for manufacturing a flat-type display according to claim 29, in which the spacer is formed of ceramics or glass.

31. (Original) The method for manufacturing a flat-type display according to claim 29, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass.

32. (Original) The method for manufacturing a flat-type display according to claim 29, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of a low-melting-point metal material.

33. (Original) The method for manufacturing a flat-type display according to claim 29, in which

the flat-type display is a cold cathode field emission display,

the first panel is an anode panel in which an anode electrode and a phosphor layer are formed, and,

the second panel is a cathode panel in which a plurality of cold cathode field emission devices are formed.

34. (Original) The method for manufacturing a flat-type display according to claim 29, in which

the flat-type display is a cold cathode field emission display,

the first panel is a cathode panel in which a plurality of cold cathode field emission devices are formed, and,

the second panel is an anode panel in which an anode electrode and a phosphor layer are formed.

35. (Original) The method for manufacturing a flat-type display according to claim 29, in which

a second low-melting-point metal material layer is formed on a portion where the spacer is to be fixed in the second panel effective field, and,

the second low-melting-point metal material layer is melted when the first panel and the second panel are bonded in their circumferential portions in said step (C), and thereby the spacer is fixed to the second panel effective field.

36. (Original) The method for manufacturing a flat-type display according to claim 35, in which the spacer is formed of ceramics or glass.

37. (Original) The method for manufacturing a flat-type display according to claim 35, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass.

38. (Original) The method for manufacturing a flat-type display according to claim 35, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of a low-melting-point metal material.

39. (Original) The method for manufacturing a flat-type display according to claim 35, in which

the flat-type display is a cold cathode field emission display,

the first panel is an anode panel in which an anode electrode and a phosphor layer are formed, and,

the second panel is a cathode panel in which a plurality of cold cathode field emission devices are formed.

40. (Original) The method for manufacturing a flat-type display according to claim 35, in which

the flat-type display is a cold cathode field emission display,

the first panel is a cathode panel in which a plurality of cold cathode field emission devices are formed, and,

the second panel is an anode panel in which an anode electrode and a phosphor layer are formed.

41. (Original) The method for manufacturing a flat-type display according to claim 29, in which

a plurality of the spacer holders for temporarily holding the spacer are formed in the first panel effective field and/or the second panel effective field.

42. (Original) The method for manufacturing a flat-type display according to claim 41, in which the spacer is formed of ceramics or glass.

43. (Original) The method for manufacturing a flat-type display according to claim 41, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of frit glass.

44. (Original) The method for manufacturing a flat-type display according to claim 41, in which the first panel and the second panel are bonded to each other in their circumferential portions through a bonding layer made of a low-melting-point metal material.

45. (Original) The method for manufacturing a flat-type display according to claim 41, in which

the flat-type display is a cold cathode field emission display,

the first panel is an anode panel in which an anode electrode and a phosphor layer are

formed, and,

the second panel is a cathode panel in which a plurality of cold cathode field emission devices are formed.

46. (Original) The method for manufacturing a flat-type display according to claim 41, in which

the flat-type display is a cold cathode field emission display,

the first panel is a cathode panel in which a plurality of cold cathode field emission devices are formed, and,

the second panel is an anode panel in which an anode electrode and a phosphor layer are formed.

47. (Previously Presented) The flat-type display according to claim 1,

wherein the first panel comprises a substratum, a partition wall formed on the substratum between one phosphor layer and another phosphor layer, and a light absorbing layer formed between the substratum and the partition wall.

48. (New) The flat-type display according to claim 1,

wherein the melting point of the low-melting-point metal material constituting the second low-melting-point metal material layers is 120° C to 400° C.

49. (New) The flat-type display according to claim 1,

wherein the melting point of the low-melting-point metal material constituting the first low-melting-point metal material layer is 120° C to 300° C.

50. (New) The flat-type display according to claim 1,

wherein the melting point of the low-melting-point metal material constituting the second low-melting-point metal material layers is 120° C to 300° C.

51. (New) The method for manufacturing a flat-type display according to claim 11, in which the melting point of the low-melting-point metal material constituting the second low-melting-point metal material layer is 120° C to 400° C.
52. (New) The method for manufacturing a flat-type display according to claim 11, in which the melting point of the low-melting-point metal material constituting the first low-melting-point metal material layer is 120° C to 300° C.
53. (New) The method for manufacturing a flat-type display according to claim 11, in which the melting point of the low-melting-point metal material constituting the second low-melting-point metal material layer is 120° C to 300° C.
54. (New) The method for manufacturing a flat-type display according to claim 29, in which the melting point of the low-melting-point metal material constituting the second low-melting-point metal material layer is 120° C to 400° C.
55. (New) The method for manufacturing a flat-type display according to claim 29, in which the melting point of the low-melting-point metal material constituting the first low-melting-point metal material layer is 120° C to 300° C.
56. (New) The method for manufacturing a flat-type display according to claim 29, in which the melting point of the low-melting-point metal material constituting the second low-melting-point metal material layer is 120° C to 300° C.